

# CALIFORNIA

## OCCUPATIONAL GUIDES

### CRIMINALISTS (FORENSIC SCIENCE TECHNICIANS)

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INTEREST AREA  
SCIENTIFIC



### WHAT DOES A CRIMINALIST (FORENSIC SCIENCE TECHNICIAN) DO?

Criminalistics is the forensic science of analyzing and interpreting evidence using the natural sciences. Forensic science pertains to all sciences applied to legal problems. CRIMINALISTS use the science of criminalistics to solve crimes. They examine and identify physical evidence to reconstruct a crime scene. Physical evidence can be a weapon, a piece of clothing, a bloodstain, drugs, or even a vapor in the air. Criminalists use this physical evidence to provide a link between a suspect and the victim. The

transfer of clothing fibers or hair fibers between a suspect and the victim can provide just such a link. Fingerprints, bullets, and shoe impressions are other important links.

Physical evidence is collected from a crime scene that includes the victim's body and the surrounding area of the crime. Criminalists collect physical evidence at crime scenes and receive evidence at the laboratory, which has been collected at the crime scene by crime scene investigators. The proper collection of evidence is essential to prevent contamination and destruction of the evidence. Once the evidence is brought to the crime lab, Criminalists conduct tests depending on the type of evidence. Criminalists are often called to court to provide expert testimony regarding their methods and findings.

O\*NET typical tasks include the following:

- Examines, tests, and analyzes tissue samples, chemical substances, physical materials, and ballistics evidence, using recording, measuring, and testing equipment.
- Interprets laboratory findings and test results to identify and classify substances, materials, and other evidence collected at crime scene.
- Collects and preserves criminal evidence used to solve cases.
- Confers with ballistics, fingerprinting, handwriting, documents, electronics, medical, chemical, or metallurgical experts concerning evidence and its interpretation.
- Reconstructs crime scene to determine relationships among pieces of evidence.
- Prepares reports or presentations of findings, investigative methods, or laboratory techniques.
- Testifies as expert witness on evidence or laboratory techniques in trials or hearings.

**Serology** is the analysis of body fluid evidence that includes bloodstains, semen stains, and saliva. To determine the identity and origin of the substance, Criminalists analyze blood dried into fabrics or other objects, as well as cigarette butts that may contain saliva residues. Sometimes the stain is not visible to the naked eye. Blood is usually visible due to its color, but often an artificial forensic light source is necessary to see other body fluid evidence. The stained evidence must remain dry and be stored at a cold temperature to maintain its integrity.

**DNA typing** is possible with a sample of body fluid such as blood, saliva, or semen. DNA typing provides a Criminalist with a genetic blueprint that is unique to each person. Criminalists then try to match the DNA typing results with a suspect. Proper handling and storage is essential to preserve DNA test samples.

**Trace evidence** is the analysis of hairs, fibers, paint, glass, wood, and soil that are present at a crime scene. Examination of trace evidence helps to establish a relationship between a suspect and the victim. A fiber may be taken from the victim's body revealing the type of fiber from carpet unique to the make and model of the suspect's car. Once trace evidence is discovered, a Criminalist or other investigator collects the evidence from the crime scene by using a pair of jeweler's tweezers and immediately places the evidence in a folded paper cone and then into a sealed evidence envelope. Trace evidence is later analyzed at the crime lab to determine its composition and origin.

**Firearms and toolmarks** analysis involves the examination of any firearm that is suspected of being used in a criminal act. Criminalists can determine the kind of bullet used and whether it was fired from the gun used to commit the crime. Toolmark analysis includes any object suspected of containing the impression of another object that served as a tool in the commission of a crime. For instance, a screwdriver makes a distinctive impression when scraped along the surface of a wall. A Criminalist will analyze the marks the screwdriver left behind.

**Impression evidence** is the evaluation of impressions made by shoes, tires, depressions in

soft soils, and all other forms of tracks and impressions. Glove and other fabric impressions, as well as bite marks in skin or food, are included. Criminalists also obtain impressions of dust from surfaces to reveal fingerprints.

**Drug identification** is used by Criminalists to analyze and identify illegal substances such as cocaine, heroin, and marijuana, that are found in plastic bags or vials at crime scenes. Criminalists must interpret the results of drug analyses in order to determine their significance to the case.

### WHAT SKILLS ARE IMPORTANT?

Important skills, knowledge, and abilities Criminalists need to do their jobs are:

- Information Gathering – Knowing how to find information and identifying essential information.
- Information Organization – Finding ways to structure or classify multiple pieces of information.
- Reading Comprehension – Understanding written sentences and paragraphs in work related documents.
- Problem Identification – Identifying the nature of problems.
- Science – Using scientific methods to solve problems.
- Critical Thinking – Using logic and analysis to identify the strengths and weaknesses of different approaches.
- Chemistry – Knowledge of the composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.
- Public Safety and Security – Knowledge of weaponry, public safety, and security operations, rules, regulations, precautions, prevention, and the protection of people, data, and property.
- English Language – Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

- **Inductive Reasoning** – The ability to combine separate pieces of information, or specific answers to problems, to form general rules or conclusions. It includes coming up with a logical explanation for why a series of seemingly unrelated events occur together.
- **Oral Expression** – The ability to communicate information and ideas in speaking so others will understand.
- **Information Ordering** – The ability to correctly follow a given rule or set of rules in order to arrange things or actions in a certain order. The things or actions can include numbers, letters, words, pictures, procedures, sentences, and mathematical or logical operations.

### WHAT'S THE WORK ENVIRONMENT?

Criminalists work in a crime laboratory and at crime scenes. The lab is well lighted, ventilated, and clean. Criminalists have office space that includes a desk and computer. Since Criminalists are in contact with physical evidence, they are exposed to disease, chemicals, odors, and fumes. Therefore, Criminalists must wear protective and disposable clothing such as gloves, eyewear, paper suits, and paper shoe coverings when handling body fluid evidence to prevent the transmission of disease. Criminalists are often called to court to provide expert testimony regarding their methods and findings.

#### **Union Membership**

Criminalists employed by public agencies are usually included in the union's law enforcement collective bargaining unit. Many unions are local within the public agency whose members they represent. Unions do not usually represent Criminalists who are privately employed.

### WHAT'S THE CALIFORNIA JOB OUTLOOK?

Job openings for Criminalists depend largely on government spending, population growth, and the crime rate. Although some Criminalists have private practices, most Criminalists in California are employed by public law enforcement agencies at the State, county, or city level. The Employment Development Department Labor Market

Information Division's occupational survey for the year 2000 indicated 630 Criminalist positions existed. A survey of some of the State's largest employers in 2001 showed there are about 270 Criminalists with the Department of Justice, 104 with the Los Angeles Sheriff's Department, 60 with the Los Angeles Police Department, and 10 with the San Francisco Police Department (city and county).

#### **Trends**

Projected job outlook depends upon both local population growth and the area's continued favorable economic conditions.

### WHAT DOES THE JOB PAY?

#### **California Earnings**

##### Forensic Science Technicians 2001 Wages

|                         |          |    |         |
|-------------------------|----------|----|---------|
| Hourly wages range from | \$16.19  | to | \$25.77 |
| Average hourly wage     | \$21.13  |    |         |
| Average annual wage     | \$43,941 |    |         |

Source: *Occupational Employment Survey of Employers by EDD/LMID.*

Salaries within a crime lab can vary due to the size and location of the lab. There are five levels of Criminalists at the county level and four at the State level. Levels depend upon years of experience, education completed, and job responsibility and authority. Job responsibilities are similar between county and State; however, the average salary ranges are somewhat higher at the State level.

#### **County**

Criminalist I and II are considered to be the entry, trainee, and sub-journey level classes. Monthly salaries range from an average of \$2,500 to \$4,200. Criminalist III is the journey-level or lead worker and monthly salaries range from about \$4,200 to \$5,200. A Supervising Criminalist functions as the first line supervisor and can earn from about \$4,600 to \$5,600 a month. A Crime Laboratory Director plans, organizes, and directs the operations of the lab and the monthly salary can range from about \$5,700 to \$6,300.

**State**

Criminalist (Range A, B, and C) are the entry, trainee, and sub-journey level classes for State Criminalists whose monthly salaries range from about \$2,700 to \$5,200. Senior Criminalist is the full journey-level class and monthly salaries start at about \$4,600 and go to about \$5,700. Criminalist Supervisor is the working supervisor level, and this position pays from about \$5,200 to \$6,300. Criminalist Managers plan and direct a criminalistic program and earn about \$6,300 to \$7,000.

**Hours**

Criminalists work 40 hours a week. They are also required to be on call. Most Criminalists that are on call follow a rotation schedule that can vary with the number of Criminalists working in the lab. When on call, Criminalists can be requested to go to a crime scene to collect evidence to assist the crime scene investigators.

**Benefits**

Benefits include vacations, holidays, sick leave, medical and dental insurance, and retirement plans.

**HOW DO I PREPARE FOR THE JOB?****Education and Training**

A bachelor's degree from a four-year college is required with a major in criminalistics, chemistry, biology, or physics. This usually includes successful completion of eight semester units of general chemistry and three semester units of quantitative analysis. Some crime labs require a master's degree in forensic science or criminalistics. A high school student should pursue a college prep program with an emphasis on science and math.

An associate of arts degree in this same field can qualify a person for the job of forensic identification specialist. This can lead to later employment as a Criminalist following the completion of a bachelor's degree.

A listing of colleges and universities which provide undergraduate, graduate, masters, and doctorate degree programs can be found at the American Academy of Forensic Sciences Web site at [www.aafs.org](http://www.aafs.org).

**Licensing and Certification**

There are no licensing and certification requirements for Criminalists. Crime labs are accredited by a national accreditation association and to ensure continuing accreditation, city, county, and State labs conduct regular proficiency tests of their Criminalists.

**Continuing Education**

Agencies regularly provide continuing education to their employees to keep them current on the latest methods and techniques in the science of criminalistics.

**HOW DO I FIND THE JOB?**

Direct application to employers remains one of the most effective job search methods. Criminalists should check job postings at government personnel offices, local law enforcement agencies, and local newspapers. They should also contact the California Association of Criminalists job link at [www.cacnews.org/jobs.htm](http://www.cacnews.org/jobs.htm). Private firms are listed in the yellow pages under Criminologists. California job openings can be found at various online job-listing systems including CalJOBS<sup>SM</sup> at [www.caljobs.ca.gov](http://www.caljobs.ca.gov) or at America's Job Bank at [www.ajb.dni.us](http://www.ajb.dni.us).

For other occupational and wage information and a listing of the largest employers in any county, visit the Employment Development Department Labor Market Information Web page at [www.calmis.ca.gov](http://www.calmis.ca.gov). Find further job search assistance from your nearest Job Service office [www.edd.ca.gov/jsloc.htm](http://www.edd.ca.gov/jsloc.htm) or the closest One-Stop site listed on the California WorkNet site, [www.sjtcc.ca.gov/sjtccweb/one-stop](http://www.sjtcc.ca.gov/sjtccweb/one-stop).

**WHERE CAN THIS JOB LEAD?**

Advancement depends on experience and knowledge of forensic testing and principles. There

are several levels a Criminalist can attain. A Criminalist enters the field at a trainee level. Once certain skills are mastered, a Criminalist can advance to a position as a lead worker, then to a Supervising Criminalist. The highest level is an administrative position as a director or manager of a crime laboratory.

#### OTHER SOURCES OF INFORMATION

State Personnel Board  
801 Capitol Mall  
Sacramento, CA 94244-2010  
(916) 653-1705  
[www.spb.ca.gov](http://www.spb.ca.gov)

American Academy of Forensic  
Sciences  
P.O. Box 669  
Colorado Springs, CO 80901-0669  
(719) 636-1100  
[www.aafs.org](http://www.aafs.org)

California Association of  
Criminalists  
P.O. Box 190681  
Sacramento, CA 95819-0681  
[www.cacnews.org](http://www.cacnews.org)

The California Criminalistics Institute  
4949 Broadway, Room A-104  
Sacramento, CA 95820  
[www.cci.ca.gov](http://www.cci.ca.gov)

California State University, Fresno  
Department of Criminology  
2225 East San Ramon MS/MF 104  
Fresno, CA 93740-8029  
(559) 278-2305  
[www.csufresno.edu/criminology/crim.htm](http://www.csufresno.edu/criminology/crim.htm)

Employment Projections by Occupation  
[www.calmis.ca.gov/htmlfile/subject/occproj.htm](http://www.calmis.ca.gov/htmlfile/subject/occproj.htm)

Employment and Wages by Occupation  
[www.calmis.ca.gov/file/occup\\$/OES\\$.htm](http://www.calmis.ca.gov/file/occup$/OES$.htm)

#### RELATED OCCUPATIONAL GUIDES

|                                 |         |
|---------------------------------|---------|
| Law Enforcement Occupations     | No. 457 |
| Crime and Intelligence Analysts | No. 557 |

#### OCCUPATIONAL CODE REFERENCES

**SOC** (*Standard Occupational Classification*)  
Forensic Science Technicians 19-4092

**O\*NET** (*Occupational Information Network*)  
Forensic Science Technicians 19-4092.00

**OES** (*Occupational Employment Statistics*)  
Physical, Life Science Techs, NEC 24599

**DOT** (*Dictionary of Occupational Titles*)  
Criminalist 029.261-026